

1. (Currently Amended) A continuous-time active complex bandpass filter comprising:

a ~~complex bandpass~~ filter having a transfer function having poles and imaginary zeros and generated using only a plurality of transconductors, ~~and~~ capacitors and buffers, including:

I input and 90-degree phase shifted Q input;

I output and 90-degree phase shifted Q output;

cross-coupled transconductors for shifting the position of  
the transfer function poles to form an unsymmetrical complex bandpass  
transfer function that transmits signals for positive frequencies and blocks signals  
for negative frequencies; or transmits signals for negative frequencies and blocks  
signals for positive frequencies; and

cross-coupled transconductors for creating the transfer  
function imaginary zeros into an unsymmetrical complex bandpass transfer function.

2. (Withdrawn) The continuous-time active complex bandpass filter of claim 1 wherein the transfer function includes an all-pole system.

3. (Cancelled)

4. (Original) The continuous-time active complex bandpass filter of claim 1 wherein said filter is fabricated in monolithic technology selected from the group consisting of silicon CMOS, BiCMOS and bipolar processes.

5. (Withdrawn) The continuous-time active complex bandpass filter of claim 2 wherein said filter is fabricated as an on-chip active device.

6. (Withdrawn) The continuous-time active complex bandpass filter of claim 2 and

further including:

a first-Order lowpass filter section having:

I input and 90-degree phase shifted Q input;

I output and 90-degree phase shifted Q output;

a pair of input transconductors for setting up the filter section gain;

a pair of  $1/g_m$  resistors connected to said input transconductors and a pair of capacitors each having a value of C, connected to said pair of resistors to form a filter section pole at frequency  $g_m/C$ ; and

a pair of cross-coupled transconductors  $g_{mA}$  connected to said input transconductor and said pair of resistors to shift the position of the said pole to a complex location at  $(g_m + jg_{mA})/C$ , or  $(g_m - jg_{mA})/C$ .

7. (Withdrawn) The continuous-time active complex bandpass filter of claim 6 and further including:

a second-Order biquad filter including a cascaded pair of said first-Order lowpass filter sections wherein said lowpass filter sections create a pair of complex conjugate poles at  $(g_m \pm jg_{mA})/C$ .

8. (Currently Amended) The continuous-time active complex bandpass filter of claim [[3]] 1 wherein said filter is fabricated as an on-chip active device.

9. (Currently Amended) The continuous-time active complex bandpass filter of claim [[3]] 1 and further including:

a first-Order lowpass filter section having:

~~I input and 90-degree phase shifted Q input;~~

~~I output and 90-degree phase shifted Q output;~~

- a pair of input unity-gain buffers;
- a pair of input capacitors having a value  $C_1$  connected to said buffers;
- a pair of  $1/g_m$  resistors connected to said input capacitors;
- a pair of output capacitors having a value  $C$  connected to said pair of resistors to form a filter section pole at frequency  $g_m/(C + C_1)$ ;
- a first pair of cross-coupled transconductors  $g_{mA}$  connected to said output capacitors and said resistors to shift the position of the said pole to a complex location at  $(g_m + jg_{mA})/(C + C_1)$ , or  $(g_m - jg_{mA})/(C + C_1)$ ; and
- a second pair of cross-coupled transconductors  $g_{mB}$  connected to said input capacitors and said resistors to form an imaginary axis zero at  $jg_{mB}/C_1$ .

10. (Original) The continuous-time active complex bandpass filter of claim 9 and further including:

- a second-Order biquad filter section including a cascaded pair of said first-Order lowpass filter sections wherein said lowpass filter sections create a pair of complex conjugate poles at  $(g_m \pm jg_{mA})/(C_1 + C)$ .

11. (Original) The continuous-time active complex bandpass filter of claim 10 having a lowpass prototype of an even-Order.

12. (Original) The continuous-time active complex bandpass filter of claim 11 and further including:

- at least one second-order biquad filter section containing no zeros, a single, a double, or two different imaginary axis zeros.

13. (Original) The continuous-time active complex bandpass filter of claim 10 having a lowpass prototype of an odd-Order.

14. (Original) The continuous-time active complex bandpass filter of claim 13 and further including:

one first-order lowpass filter section containing no zeros, or a single imaginary axis zero; and

at least one second-order biquad filter section containing no zeros, a single, a double, or two different imaginary axis zeros.